FIG. 1

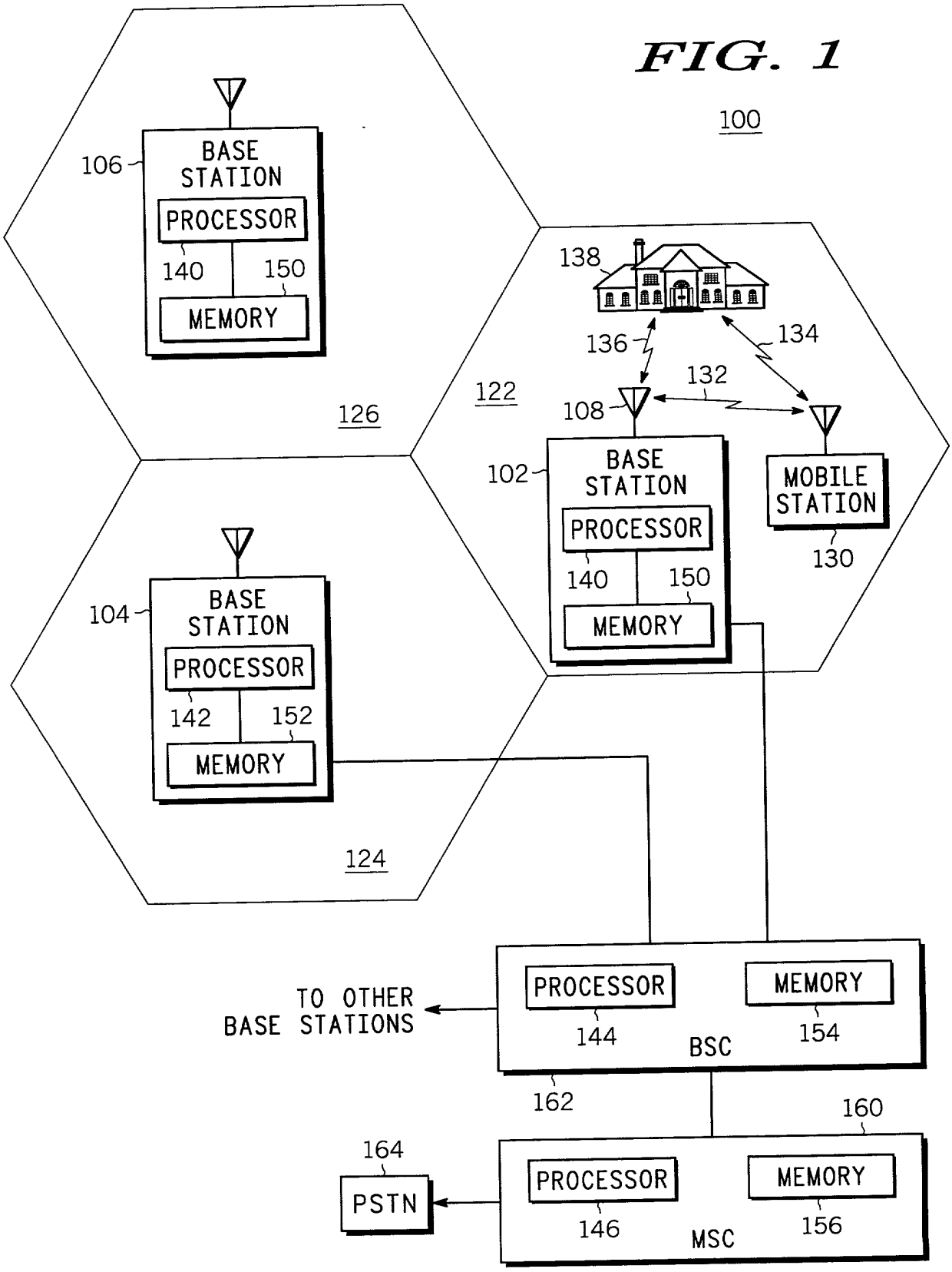
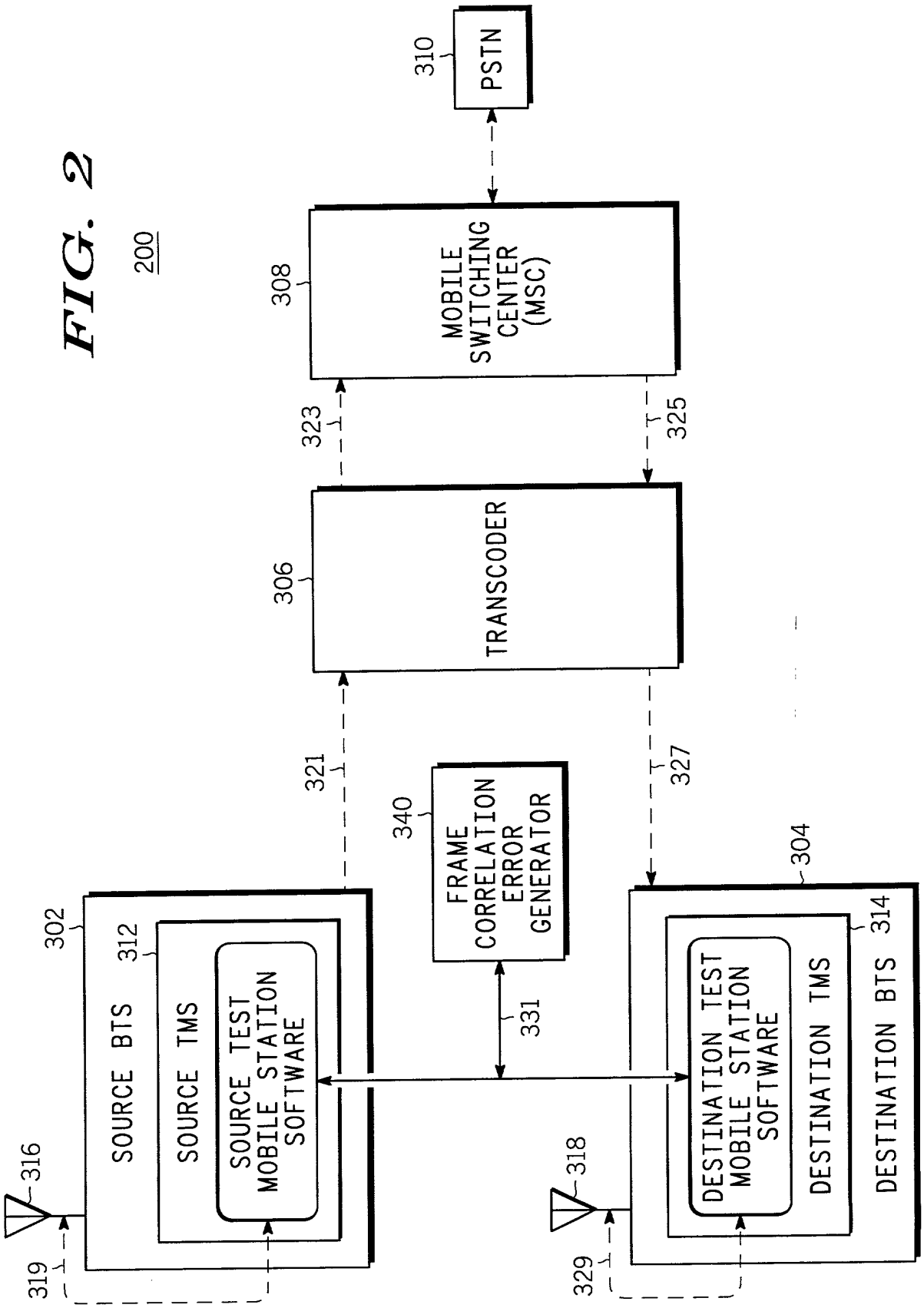
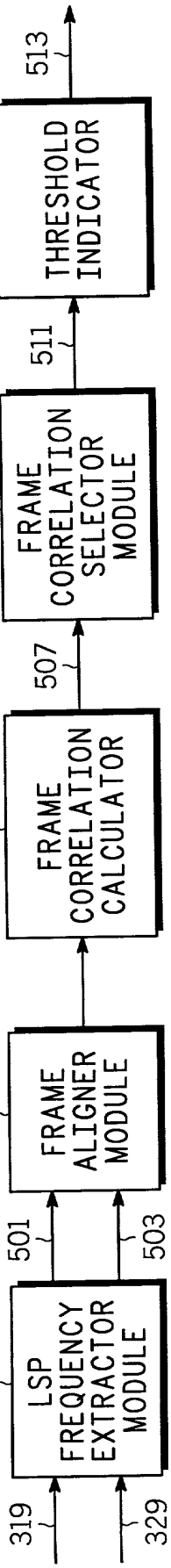

100
106
BASE STATION
PROCESSOR
140
150
MEMORY
126
138
136
134
132
122
108
102
BASE STATION
PROCESSOR
140
150
MEMORY
MOBILE STATION
130
104
BASE STATION
PROCESSOR
142
152
MEMORY
124
TO OTHER BASE STATIONS
PROCESSOR
144
MEMORY
154
BSC
162
160
164
PSTN
PROCESSOR
146
MEMORY
156
MSC

FIG. 2


200
310
PSTN
308
MOBILE SWITCHING CENTER (MSC)
323
325
306
TRANSCODER
321
327
340
FRAME CORRELATION ERROR GENERATOR
331
304
302
SOURCE BTS
312
SOURCE TMS
SOURCE TEST MOBILE STATION SOFTWARE
316
319
314
DESTINATION BTS
DESTINATION TMS
DESTINATION TEST MOBILE STATION SOFTWARE
318
329

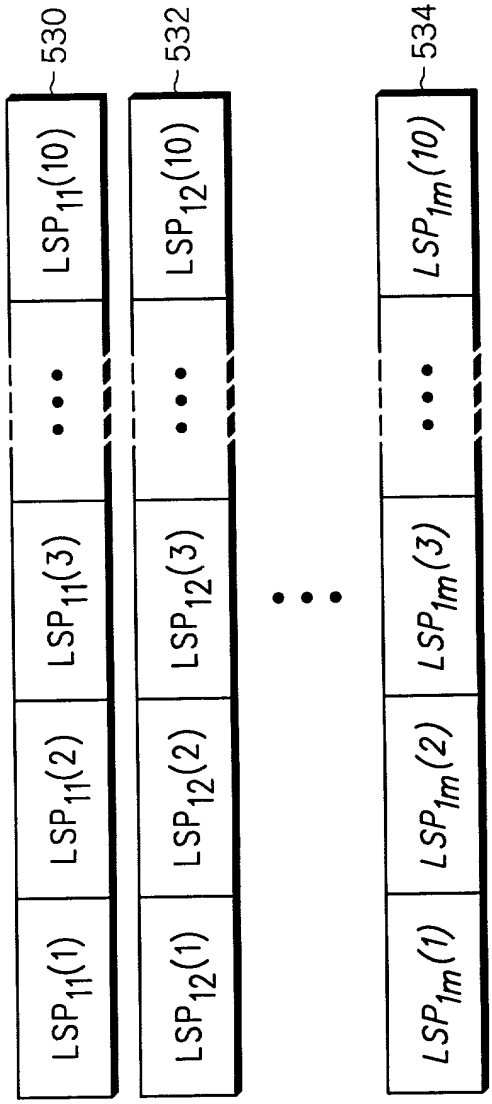


340

FIG. 3

FIG. 4

501



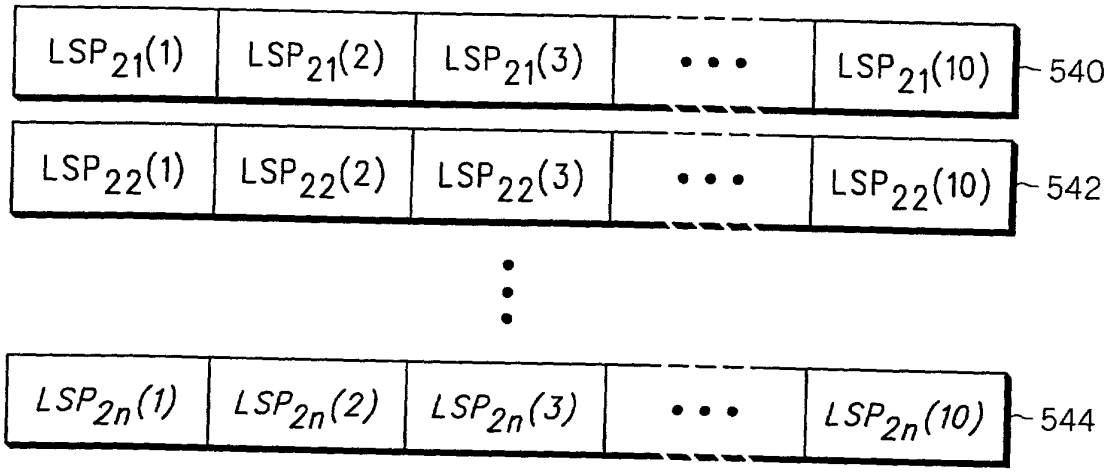
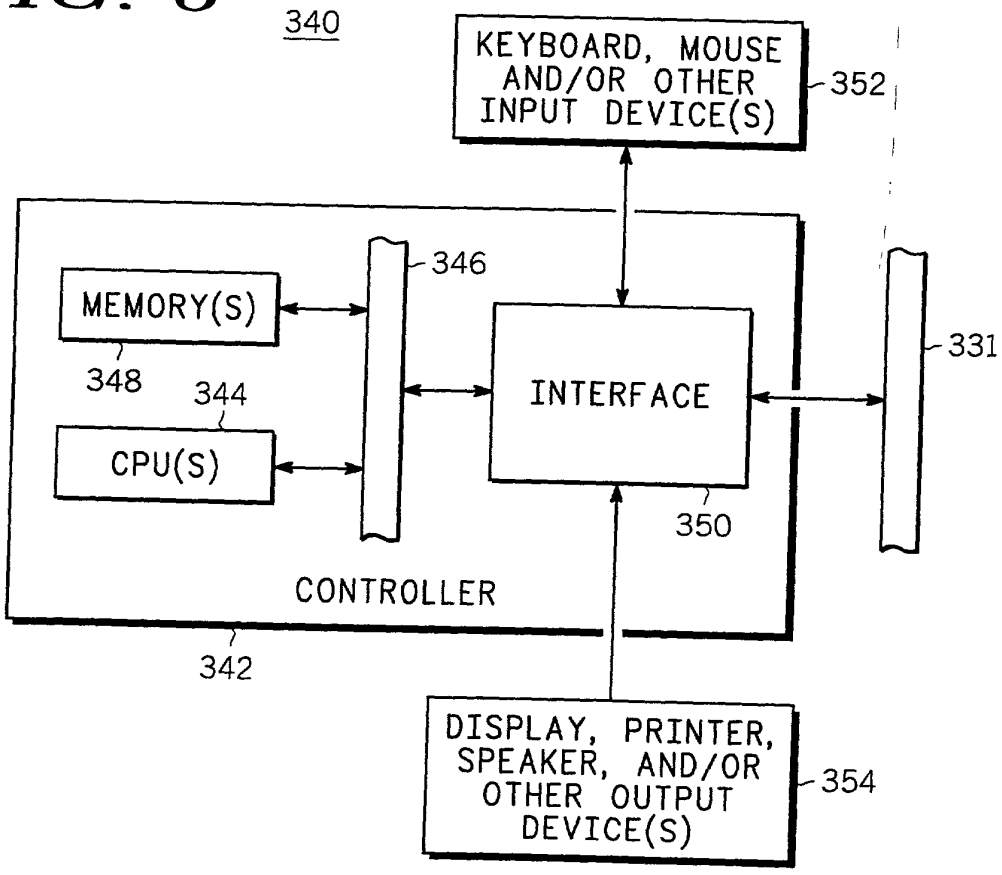

LSP21(1)
LSP21(2)
LSP21(3)
• • •
LSP21(10)
540
LSP22(1)
LSP22(2)
LSP22(3)
• • •
LSP22(10)
542
LSP2n(1)
LSP2n(2)
LSP2n(3)
• • •
LSP2n(10)
544
503

FIG. 5

FIG. 6


340
KEYBOARD, MOUSE AND/OR OTHER INPUT DEVICE(S)
352
MEMORY(S)
348
344
CPU(S)
346
INTERFACE
350
331
CONTROLLER
342
DISPLAY, PRINTER, SPEAKER, AND/OR OTHER OUTPUT DEVICE(S)
354

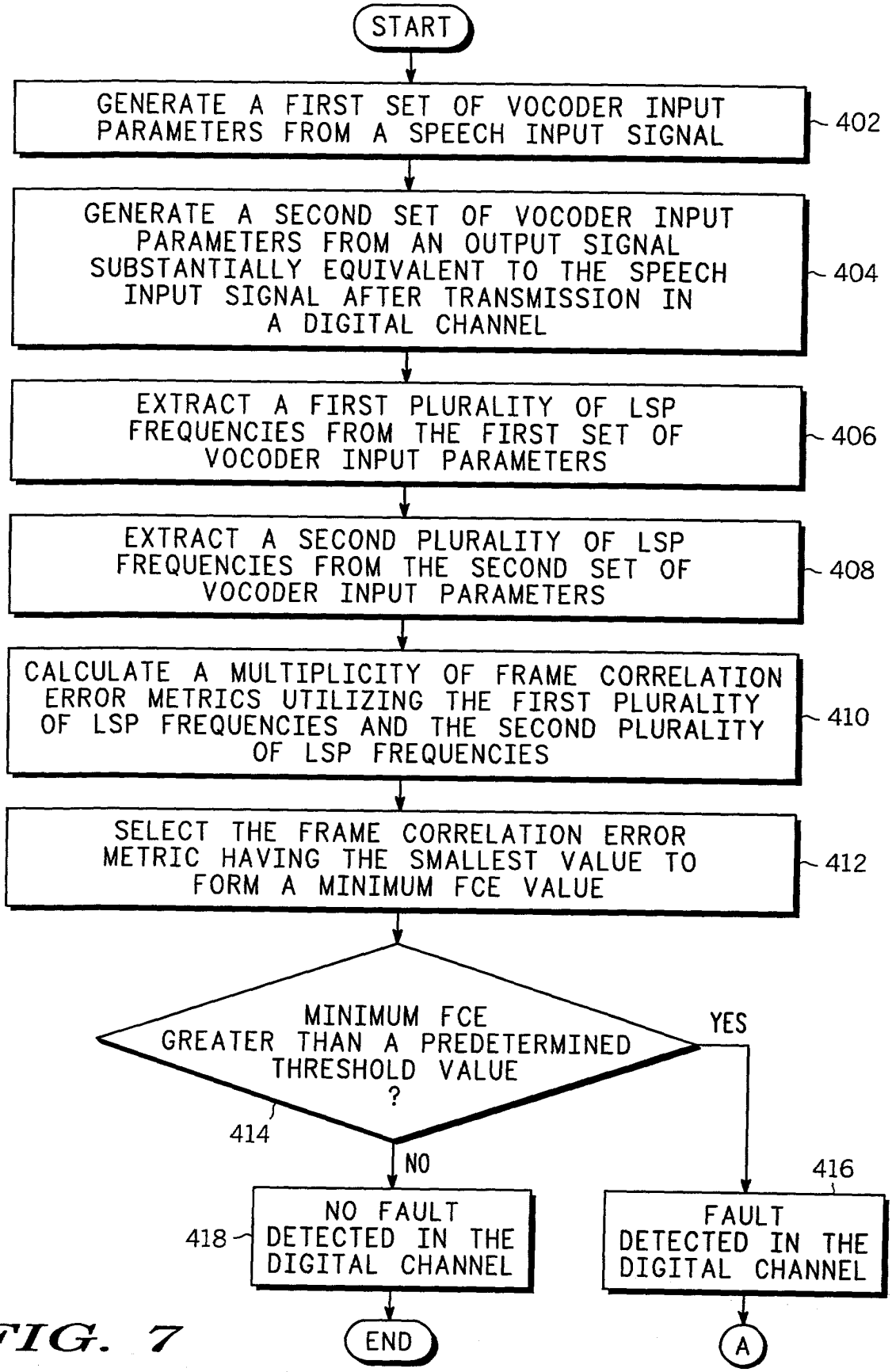

START
GENERATE A FIRST SET OF VOCODER INPUT PARAMETERS FROM A SPEECH INPUT SIGNAL
402
GENERATE A SECOND SET OF VOCODER INPUT PARAMETERS FROM AN OUTPUT SIGNAL SUBSTANTIALLY EQUIVALENT TO THE SPEECH INPUT SIGNAL AFTER TRANSMISSION IN A DIGITAL CHANNEL
404
EXTRACT A FIRST PLURALITY OF LSP FREQUENCIES FROM THE FIRST SET OF VOCODER INPUT PARAMETERS
406
EXTRACT A SECOND PLURALITY OF LSP FREQUENCIES FROM THE SECOND SET OF VOCODER INPUT PARAMETERS
408
CALCULATE A MULTIPLICITY OF FRAME CORRELATION ERROR METRICS UTILIZING THE FIRST PLURALITY OF LSP FREQUENCIES AND THE SECOND PLURALITY OF LSP FREQUENCIES
410
SELECT THE FRAME CORRELATION ERROR METRIC HAVING THE SMALLEST VALUE TO FORM A MINIMUM FCE VALUE
412
MINIMUM FCE GREATER THAN A PREDETERMINED THRESHOLD VALUE ?
414
YES
NO
416
NO FAULT DETECTED IN THE DIGITAL CHANNEL
418
FAULT DETECTED IN THE DIGITAL CHANNEL
END
A

FIG. 7

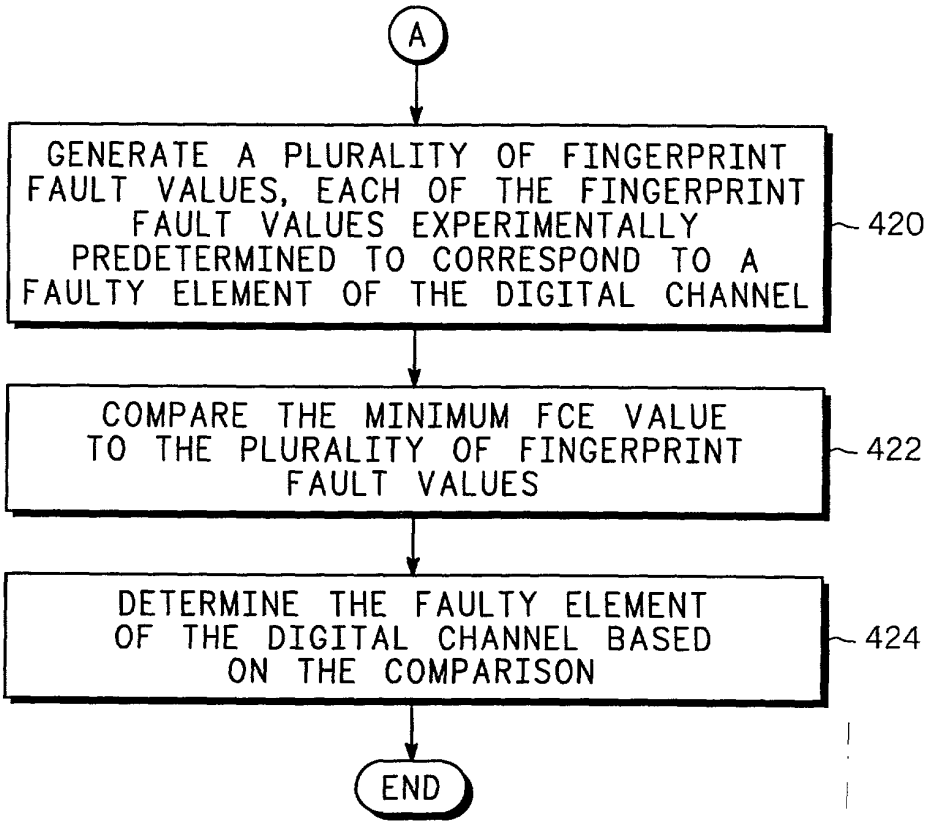

A
GENERATE A PLURALITY OF FINGERPRINT FAULT VALUES, EACH OF THE FINGERPRINT FAULT VALUES EXPERIMENTALLY PREDETERMINED TO CORRESPOND TO A FAULTY ELEMENT OF THE DIGITAL CHANNEL
420
COMPARE THE MINIMUM FCE VALUE TO THE PLURALITY OF FINGERPRINT FAULT VALUES
422
DETERMINE THE FAULTY ELEMENT OF THE DIGITAL CHANNEL BASED ON THE COMPARISON
424
END

FIG. 8

7/7

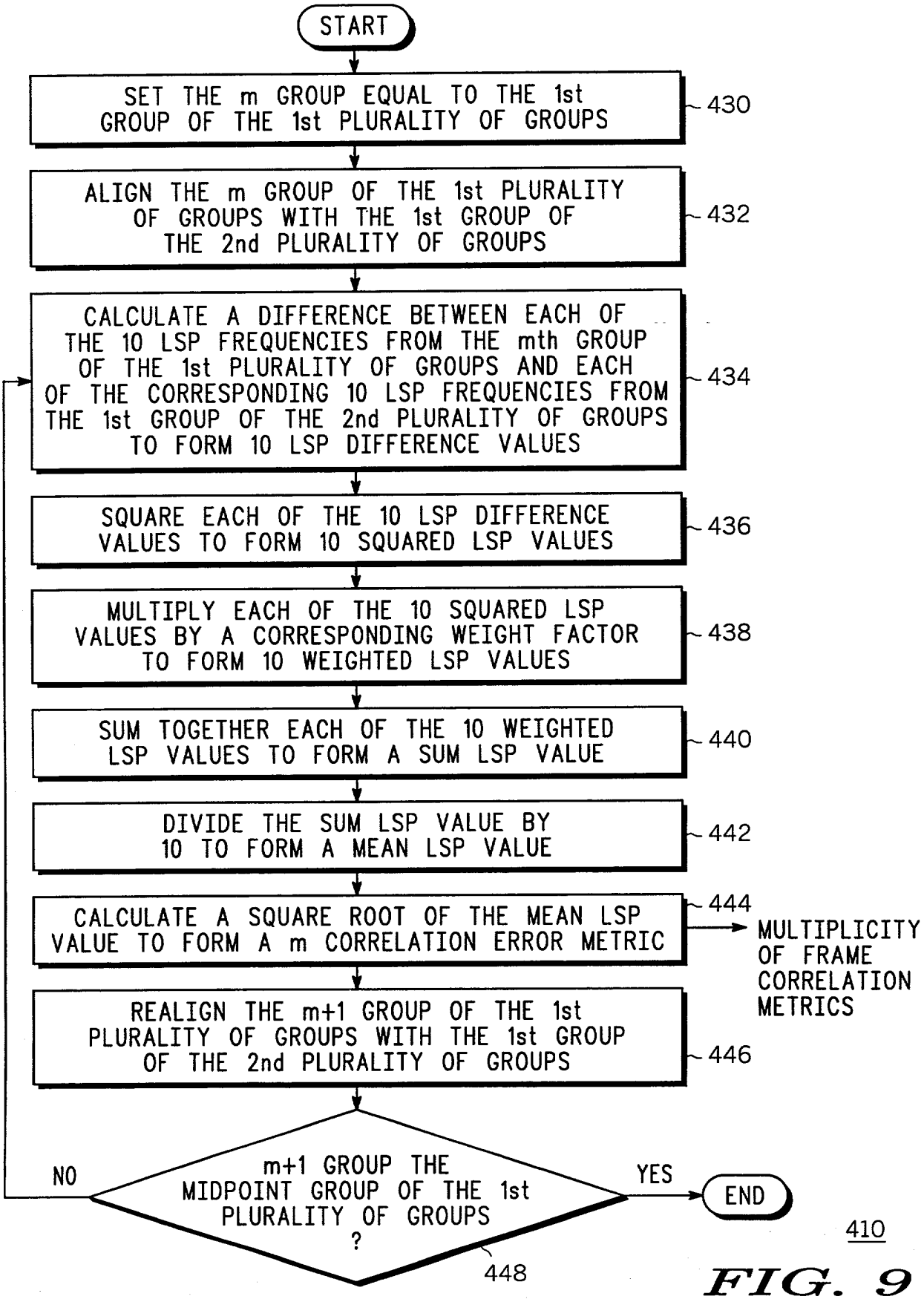

START
SET THE m GROUP EQUAL TO THE 1st GROUP OF THE 1st PLURALITY OF GROUPS
430
ALIGN THE m GROUP OF THE 1st PLURALITY OF GROUPS WITH THE 1st GROUP OF THE 2nd PLURALITY OF GROUPS
432
CALCULATE A DIFFERENCE BETWEEN EACH OF THE 10 LSP FREQUENCIES FROM THE mth GROUP OF THE 1st PLURALITY OF GROUPS AND EACH OF THE CORRESPONDING 10 LSP FREQUENCIES FROM THE 1st GROUP OF THE 2nd PLURALITY OF GROUPS TO FORM 10 LSP DIFFERENCE VALUES
434
SQUARE EACH OF THE 10 LSP DIFFERENCE VALUES TO FORM 10 SQUARED LSP VALUES
436
MULTIPLY EACH OF THE 10 SQUARED LSP VALUES BY A CORRESPONDING WEIGHT FACTOR TO FORM 10 WEIGHTED LSP VALUES
438
SUM TOGETHER EACH OF THE 10 WEIGHTED LSP VALUES TO FORM A SUM LSP VALUE
440
DIVIDE THE SUM LSP VALUE BY 10 TO FORM A MEAN LSP VALUE
442
CALCULATE A SQUARE ROOT OF THE MEAN LSP VALUE TO FORM A m CORRELATION ERROR METRIC
444
MULTIPLICITY OF FRAME CORRELATION METRICS
REALIGN THE m+1 GROUP OF THE 1st PLURALITY OF GROUPS WITH THE 1st GROUP OF THE 2nd PLURALITY OF GROUPS
446
m+1 GROUP THE MIDPOINT GROUP OF THE 1st PLURALITY OF GROUPS ?
448
NO
YES
END
410

FIG. 9